

Name:

Period:

Which of the following statements are true of an exponential function? Select all that apply.

- A. In an exponential function, there is a common multiplier.
- B. As the  $y$ -value increases by some constant value, the  $x$ -value is multiplied by a constant value.
- C. Repeated multiplication produces exponential data.
- D. The graph of an exponential function is a curve.
- E. Exponential functions have a constant rate of change.

Drag tiles to the correct slots to complete each statement.

The rule for an exponential function is . The variable  $a$  indicates the  of the graph. The variable  $b$  is the . The  is an asymptote for the graph of an exponential function.

Consider the change in population of two high schools: King High School and Kennedy High School. In 2005, each high school had 2000 students. The school district administration predicted that King High School would grow by 2% every year. The administration predicted that Kennedy High School's enrollment would decline by 3% each year. Let  $t$  represent the year 2005. What are the independent and dependent variables in this situation?

- A.  $x$  = number of students (independent)  
 $y$  = number of years since 2005 (dependent)
- B.  $x$  = number of years since 2005 (independent)  
 $y$  = number of students (dependent)
- C.  $x$  = number of years the school has been open (independent)  
 $y$  = number of students (dependent)
- D.  $x$  = number of graduating students each year (independent)  
 $y$  = number of years since 2005 (dependent)

You have defined the variables. Now you can establish a function rule. Drag the tiles to display the format of a function rule to predict the enrollment at each school.

$$A = B \cdot C^D$$

Tiles:

Tile1 growth rate

Tile2 number of years since 2005

Tile3 total number of students

Tile4 original number of students

Recall that the school district administration anticipated a 3% annual decline in enrollment at Kennedy High School. The school had 2000 students in 2005. Given the above information, which function rule describes the enrollment at Kennedy High School?

- A.  $y = 2000 \cdot 3^x$
- B.  $y = 2000 \cdot 0.003^x$
- C.  $y = 2000 \cdot 1.003^x$
- D.  $y = 2000 \cdot 0.97^x$

Now that you have established a function rule, complete this table for the predicted enrollment at Kennedy High School. Remember, 0 represents the year 2005, when there were 2000 students. Round the enrollments to the nearest student.

| Years | Predicted enrollment |
|-------|----------------------|
| 2005  | _____ A              |
| 2006  | _____ B              |
| 2007  | _____ C              |
| 2008  | _____ D              |
| 2009  | _____ E              |
| 2010  | _____ F              |
| 2015  | _____ G              |

Graph the function:

If the predicted model holds true, how many students will be attending King High School in 2013?

- A. 2,343
- B. 8,600
- C. 2,013
- D. 16,320

If the predicted model holds true, in what year will there be 1400 students at Kennedy High School?

- A. 2007
- B. Never
- C. 2016
- D. 2017